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Assessing public leadership styles for innovation: a comparison of Copenhagen, Rotterdam and Barcelona

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ABSTRACT

This article explores which leadership qualities public managers regard as important for public innovation. It is based on a survey of 365 senior public managers in Copenhagen, Rotterdam and Barcelona. Five perspectives on leadership were identified and tested using a number of items. Some of these proved to be more robust than others. Analysis of the three cities reveals a nuanced set of leadership styles, which include a transformational style, and one that is more dedicated to motivating employees, risk-taking and including others in decision-making. This suggests the need for more research on leadership and public-sector innovation.

KEY WORDS Leadership; innovation; leadership scales; transformational leadership; network governance

Introduction: innovation and leadership qualities

Public organizations, and especially municipalities, are under severe pressure to produce more value for public money. Societal challenges such as fiscal crises, changes in demography and social inequity are challenging local governments to cope with new way of tackling these problems. Reinforced by the last financial crisis, policymakers have been realizing that policy instruments for balancing markets are expensive, and one of the new buzz words is innovation or ‘social innovation’ which is related to the public good (Pyka and Hanusch 2013). Notwithstanding the problematic nature of the term innovation, with its contested place in regard to government administration in particular, and its strong normatively positive overtones, it has become essential for public services to engage with the concept. For our purposes, we begin from the position that innovation simply means producing something new; that is, doing things differently or in a new way. It is often linked to the concept of Joseph Schumpeter’s creative destruction (Schumpeter 1942), emphasizing that although innovation is positively associated with economic growth, it also has a destructive side to it.

From both the Schumpeterian and Freeman view on innovation, the public sector may not be seen as a natural source of innovation, which instead arises from the

competitive advantage gained as an economic agent on markets. However, the idea of innovation systems (Malerba 2002; Lundvall 2007) building on the later work of Schumpeter (1942) and Freeman (1995) sees innovation arising from processes of more complex systems of user–producer connectivity (von Hippel 1976; Lundvall et al. 2002). What these ideas have in common is that they build on the concept of open innovation to use the term of Eric von Hippel (1988), and contrast earlier perception of innovation as a simple linear process or as one-source-only type of model. Most recently, Neo-Schumpeterian scholars have focused on innovation networks and interconnectivity (Pyka and Hanusch 2013; Ricard 2015), in relation to building innovation capacity. Innovation or social innovation (when dealing with the public sector) is mostly described as an economic phenomenon, but behind it also lies a rationale that the social and more participatory processes that come from innovation reflects ‘the type of social interactions which increases both the efficiency and the efficacy of the public sector’ (Pyka and Hanusch 2013,30).

While much talk and public-sector research is centred on why the public sector should change and what changes should be made (Bartlett and Dibben 2002), little is known about how to tilt whole systems towards having greater innovation capacity. One research opportunity that has arisen out of this lack is the focus on public-sector environments (inside and outside government) that support innovation, including the role of leadership associated with innovation. Leaders are thought to be crucial for innovation, and the question of which leadership qualities are necessary to stimulate and implement innovation has been, and still is, an important question in practice and research (see Howell and Avolio 1993; Van Wart 2012; Tummers and Knies 2013).

A staggering number of leadership qualities are mentioned in the leadership literature. In this article, we use a survey of 365 top-level public managers in three different cities – Copenhagen (Denmark), Rotterdam (the Netherlands) and Barcelona (Spain) – to identify which leadership qualities they consider to be important to public innovation. In all these countries, there is pressure from the government to innovate and to do better in a context of financial resources and adapt to demographic change. In the Netherlands and Denmark, decentralization has brought about a shift from central government to lower governmental tiers, which has been accompanied by budget cuts; while Spain has been the scene of major economic problems during the last 5–10 years. The three municipalities studied all differ regarding the country and type of city in which they are located, governance structures and leadership training, but they are similar enough to create an interesting comparison of public managers across municipalities. Whereas Copenhagen is the capital city of Denmark, Rotterdam is the second largest city in the Netherlands, after the capital Amsterdam. Barcelona is the capital city of Catalonia, an autonomous community in Spain. Spain has the strongest local governments of the three countries, while the other two countries have relatively strong local governments. Denmark is the ‘most innovative’ of these three, based on the European Commission Innovation Union Scoreboard¹ index, followed by the Netherlands, and Spain is ranked substantially lower than the other two cities.

In summary, public-sector innovation is now seen as important, and there is an urgent need to understand what supports it. Leadership is an important component of innovation capacity, along with the more usual structural and governance considerations, but it has not been widely studied in this context. The research question

addressed in this article is: *What leadership styles support public-sector innovation according to senior managers?*

First, we distinguish between five theoretical perspectives on leadership, and then we investigate which of these emerge from the opinions gathered in our survey of three cities. This is built on a five-factor model of public leadership styles that are seen to support innovation. Second, we analyse the three cities separately with a view to uncovering which leadership styles were regarded as present in the different localities. We show that there are common types that are thought to have been at play (or possibly that ought to be) when important innovations have arisen in all three municipalities, despite their differences. We then discuss the implications of the findings for further research within the limitations of the study.

Theoretical overview: leadership and innovation

Different perspectives on leadership tend to emphasize different activities that are essential to leadership as well as different perspectives on innovation. In general, a distinction is made between more rational or transactional leadership perspectives, on the one hand, creating stability and transformational leadership perspectives, on the other hand, steering through change processes. Transactional leadership perspectives tend to stress the exchange between leaders and followers, and the self-interest connected to these relationships, but also monitoring and planning processes that have to be defined (see Van Wart 2012, 89). Transformational leadership perspectives share an emphasis on goals and performance with the transactional perspective, but they pay more attention to the charismatic characteristics of leaders and the symbolic processes needed to create change and transform organizations (Bass 1985, 1997; Van Wart 2012). Besides these two dominant perspectives, many authors also identify a more relational leadership perspective that emphasizes personal relations with followers and subordinates (see van Dierendonck 2011; Van Wart 2012; Tummers and Knies 2013).

Recently, various authors have added a new leadership perspective that places greater emphasis on how public organizations change in response to turbulent environments. This perspective tends to focus more on the path dependency of (public) organizations, on the one hand and their operational capacity building to promote change, on the other hand (see Piening 2013). We may call this a more entrepreneurial perspective on leadership. It relates to the transformational leadership perspective but focuses more on the search for new knowledge and the need to take risks.

Surprisingly, however, the mainstream leadership literature seems to largely ignore the emphasis on collaboration and relationship building that is emphasized in the literature about governance, collaboration and networks in the public sector. This literature points out that actors have different perceptions about the nature of problems and desirable solutions to them, which means that problem-solving processes involve complicated negotiations in networks of (interdependent) actors that require very specific leadership qualities and actions (Gage and Mandell 1990; Kickert, Klijn, and Koppenjan 1997). In contrast, much leadership literature focuses on leadership *within* organizations and so far has paid very little attention to the fast growing interorganizational collaboration and network governance perspectives that have become quite dominant in Public Administration research (Rhodes 1997;

Kickert, Klijn, and Koppenjan 1997; Pierre 2000) and important to innovation (Osborne and Brown 2011; Lewis, Considine, and Alexander 2011).

These considerations led us to identify five perspectives on public leadership that have special relevance for the topic of innovation: a transactional style, a transformational style, an interpersonal style an entrepreneurial style and a network governance style. We argue that each of these perspectives will give rise to different views on the following:

- The nature of leadership: What is the role of leaders and from where do they gain their legitimacy?
- The main activities a leader should perform: What kinds of activities are the most important for leaders to perform?
- Strategic direction: How is direction achieved in leadership – e.g. by setting goals or by creating joint learning activities?
- How are innovations viewed?

Table 1 provides a summary of the dimensions for each of the five leadership styles.

Transactional leadership perspectives: investigating change from above

In general, classic theories about leadership have a strong top-down character. They mostly assume that there is one best way to lead and that is through a directive leadership style. Transactional theories build on this approach, but pay more attention to the relationship between leaders and followers. Although in transactional approaches the leader is still presented as a supervisor who should be leading people in the organization, more attention is paid to the reward structure and legitimacy of the leader. In the transactional perspective, leaders rely mostly on rational incentives and strategies to obtain the desired performance, and the relationship between leaders and other actors is characterized by a clear hierarchy. Leaders try to steer by clarifying goals, monitoring the behaviour of subordinates and emphasizing task-oriented domains (Van Wart 2012). Innovation clearly emanates from the leader and his/her ability to steer subordinates.

Transformational leadership: bringing change to organizations

The transformational perspective on leadership builds on earlier transactional perspectives that emphasize the relationship between leaders and followers but add a supportive style to complement the directive style. Transformational leadership strongly emphasizes the charismatic characteristics of leaders and claims that leaders must change the organization, and the people in it, in order to achieve the necessary goals (Tichy and Devanna 1990). This means that leaders have to recognize the need for change and innovation, formulate visions and implement changes by motivating people within the organization (Bass 1985). Thus, the transformational style places the leader in the centre as the core figure – the charismatic person around whom changes, and thus also innovations (and performance), take place. However, there is a supportive element in the theories about transformational leadership; see Bass (1985), (1997), Leong and Fischer (2011) and Van Wart (2012). Innovations in the

Table 1. Leadership perspectives compared.

	Transactional leadership	Transformational leadership	Interpersonal leadership	Entrepreneurial leadership	Network governance leadership
The nature of leadership	Strong directive image of leaders	Leaders are charismatic people that drive change and performance	Leaders secure outcomes through people in organizations	Entrepreneurs embedded in organizational routines	Leader is 'primus inter pares' more a facilitator that brings actors together
Main activities	Creating (rational) incentives for people in organizations Monitoring behaviour	Creating new visions Designing institutional changes Putting in place incentives for employees (coaching, support, rewards)	Empowerment of people Creating an atmosphere of trust and cooperation	Strategizing, resource acquisition and changing organizational routines to bring about change	Connecting actors, arranging processes, exploring new content and setting ground rules for interactions
Strategic direction	Setting clear goals and monitoring them	Importance of a clear and inspiring vision and aiming for exceptional performance	Content is derived by persuasion and working together with employees	Ideas for change are influenced by the past: continuity and change	Content is not given. You organize the process to develop content that is innovative and interesting to involved stakeholders
Innovation is viewed as:	Initiated by leaders and their ability to steer subordinates	Achieved by charismatic leaders who initiate the changes needed	Achieved by authentic leaders whose strength lies in stewardship and altruistic behaviour	Driven by the need to adapt to the environment and the leader's ability to adjust routines	Achieved by collaborative leaders who are able to explore new ideas and connect various actors to these ideas

transformational perspective are thus related to strong charismatic leaders who initiate change and thereby make a difference to the organization.

Interpersonal leadership: interacting with followers and being altruistic

Interpersonal or relationship-based theories of leadership emphasize how leaders interact with their employees and how they manage these relationships to get the best out of them (see Tummers and Knies 2013). Characteristics such as humbleness, authenticity and stewardship are mentioned as core qualities of a leader, clearly distinguishing most interpersonal leadership perspectives from more transactional and transformational approaches to leadership (see van Dierendonck 2011; Van Wart 2012; Tummers and Knies 2013). In this interpersonal perspective, the leader is a facilitator who builds relationships vis-à-vis the people in the organization, provides a moral example and is willing to take responsibility for the whole organization and its members (stewardship). Activities performed by leaders in this perspective mainly involve the empowerment of employees and fostering an atmosphere of trust and cooperation among employees (see van Dierendonck 2011). Innovation results from the creativity of the organization's followers and employees.

Entrepreneurial leadership perspective: transforming public organizations

Public-sector environments change rapidly due to frequent changes in policy or in the societal environment in which public organizations must operate (Pablo et al. 2007; Piening 2013). The entrepreneurial perspective on leadership – which is strongly present in recent theories of dynamic capability, for instance, but also in work on more strategic styles of leadership (Van Wart 2012) – emphasizes the strategic capacity to act, but also points to the path dependency of organizations that can find themselves caught up in their past routines and organizational behaviour (Teece 2007; Piening 2013).

Seen from the entrepreneurial leadership perspective, leaders initiate change through strategic actions, reshaping organizational routines and (re)mobilizing resources. In this view, innovation is likely to be strongly related to leaders' ability to adapt the organization to a changing environment and to create organizational conditions that are conducive to change. In public organizations, these assets include the political environment but also the ability to obtain sufficient resources.

Network governance leadership style: binding actors to a joint solution

There is a broad consensus in the contemporary governance literature that (network) management or leadership is essential, and that the type of leadership and/or management required in networks and collaborative settings differs significantly from the classical image of organizational leadership (see Gage and Mandell 1990; Kickert, Klijn, and Koppenjan 1997; Pierre 2000). Ansell and Gash (2008) talk about facilitating leadership: by this, they mean that the task of a leader is to mediate between actors and empower the collaboration process. Thus, the leadership and management style appropriate in networks and collaborative processes is one of facilitating, activating actors and necessary resources, and enhancing their

collaboration (see also Huxham and Vangen 2005; Gage and Mandell 1990; Agranoff and McGuire 2001). Here, the leader is someone who carefully examines the network of available actors, connects them to each other, facilitates exploration of solutions to address problems and engages the involved actors in order to deploy the resources needed for implementation (Klijn, Steijn, and Edelenbos 2010). Consequently, they have to build trust and cooperation among actors with different perceptions of the problems in question, different ideas about the most desirable solutions to them and different interests (McGuire and Agranoff 2011; Koppenjan and Klijn 2004; Klijn, Edelenbos, and Steijn 2010). Innovations, in this view, are achieved by collaborative leaders who connect actors and necessary information and are able to share their success with others.

Five leadership styles

Building on earlier leadership research, we identified these five theoretical styles and derived a list of leadership qualities. In that regard, one of the most influential scholars in developing our questionnaire items on transformational leadership was Bass (1997; see also Howell and Avolio 1993), who focused on three main dimensions: charisma, being inspirational and individual considerations. Recent studies like Leong and Fischer's (2011) study which investigates whether the transformational leader is universal, and the study by Stanley Wong (2013) on the role of management in innovation (and especially Bass 1997) served as further inspiration in developing our questionnaire items. Our leadership quality items are shown in Table 2. Some leadership qualities in Table 2 fit with more than one leadership perspective, reflecting the theoretical overlap between the perspectives. The visionary character, for instance, fits both in the transformational and the entrepreneurial leadership perspectives. Some attributes were expected to be negatively correlated to certain perspectives, such as a short-term perspective, being authoritative, always following procedure and taking all decisions alone.

Methods and data analysis: the survey of three municipalities

A survey of 365 respondents among the top level of public managers in Copenhagen, Rotterdam and Barcelona municipalities was used to collect information for this study. The number of respondents is sufficient for scale development purposes, following Nunnally and Bernstein's (1994) guideline that 300 is an adequate number. The response rates were approximately 40 per cent in both Copenhagen and Rotterdam and only 28 per cent in Barcelona² (see Table 3).

Building on the ideas of innovation as a path breaker (a creative destruction) and a learning process, the respondents were given the following definition of innovation: 'the process from ideas to successful implementation of these, which makes a substantial difference to an organization's understanding of the societal needs it is addressing and the services it delivers'. An English version of the questionnaire was created first, and the questions were then translated into Danish, Dutch and Catalan, for use in Copenhagen, Rotterdam and Barcelona, respectively. The translations and the data were carefully handled by the authors of this paper. The survey consisted of twenty-three leadership attributes derived from the five theoretical concepts and then translated into practical statements. A

Table 2. Leadership qualities aligned with the five theoretical perspectives.

Questionnaire item/scales	Transactional	Transformational	Interpersonal/altruistic	Network governance	Entrepreneurial
A. Good communication skills			X	X	
B. Visionary		X			X
C. Takes initiative	X	X			X
D. Authoritative	X				
E. Visible leadership		X			
F. Displays a long-term perspective		(X)		X	X
G. Displays a short-term perspective	X			X	X
H. Good at gathering information	(X)			X	X
I. Problem-oriented	X			X	X
J. Results-oriented		X			X
K. Inspirational		X			
L. Provides intellectual stimulation			X		
M. Committed to colleagues and organization		X	X	X	
N. Willing to sacrifice self-interest			X		
O. Good at mobilizing the resources needed		X		X	X
P. Works collaboratively				X	
Q. Knowledgeable			X		X
R. Good at learning from mistakes			X		
S. Willing to risk mistakes by employees			X		
T. Open towards new ideas		X		X	X
U. Takes all decisions alone (–)	X	X			
V. Involves others in key decisions			(X)		
W. Always follows procedures	X			X	

Table 3. Number of respondents on leadership questions among civil servants.

City/formal levels ^a	1 CEOs	2 Line managers	3 Program managers, etc.	Number of respondents	Valid number of respondents ^b
Copenhagen	1	45	127	173	157
Rotterdam	28	73	57	158	153
Barcelona	10	43	7	60	55
Total	39	161	191	391	365

Notes: ^a We did control for formal levels and found no significant correlations between the emerged factors shown in the pattern matrices; ^bValid responses were those with *no* missing values in the series of leadership questions.

five-point Likert scale was used, with respondents asked to rate these statements in relation to the degree to which they perceived the attributes to be present in the municipality, in relation to leadership and past innovations in the municipality. The overall question they were asked before presenting these statements was: *‘Thinking about your administration/municipality in relation to important innovations, to what degree do you think the leadership (both politicians and administrators) has displayed the following qualities and behaviours?’*

The survey was addressed to both politicians and administrators in all three municipalities. However, there are relatively few politicians working full time in the municipality compared to the number of senior administrators – and we got few replies. The few politicians in our sample were therefore taken out (two in Copenhagen, nine in Rotterdam and seven in Barcelona). Based on the formulation of the question, respondents should be referring to leadership qualities that they think were present within their municipality, in regard to the innovations that they were familiar with. Following the nature of this question, it should be emphasized that the responses are senior managers’ perceptions of the leadership qualities they think were present when important innovations were happening: this is not the same as responding in terms of what was, or was not, empirically carried out and evaluated as successful or unsuccessful in regard to innovation.

To avoid common method bias, the order of the items was randomized in the online survey in Copenhagen and Barcelona, so that the items appeared in a different order for each manager answering the statements, but this was not the case for Rotterdam. However, we found no systematic bias/peculiarities that might have made the sequence less reliable.

As noted earlier, the three municipalities in this study reflect different geographical areas and state and society traditions, which are likely to influence their innovation environments. The empirical research strategy therefore builds on first defining the groups of leadership attributes reported by our respondents, and then examining differences between the three municipalities.

The selection was guided by both theoretical and practical reasons. We included a southern European and two northern European countries in the study. The research was part of a large European research project and these were the cities that were selected for the overall research proposal. The advantage of this was that we had researchers active in each city, with established contacts with people in the

municipalities, and the ability to work in their native language which turned out to be very important to gather the data.

As noted earlier, the countries and the cities themselves all vary in regard to national and local government structures, and their innovation scores, but are not so different as to be inappropriate for comparative analysis leadership and innovation.

We used the five perspectives outlined in the theoretical section (a ‘top-down’ approach) to test whether they could be observed empirically in the survey responses. This was done using an exploratory factor analysis (EFA) using dimensions reduction with principal axis factoring (promax rotation). In performing dimension reductions moving from twenty-three scale items (observed variables) to three factors, all analyses were performed using covariance matrices. Reliability analysis on each of the five types was used to examine which factors were coherent and which were not. We then moved from the pattern matrix in the EFA to a confirmatory factor analysis (CFA) to see how well this hypothesized five-factor model fitted the data and to examine the correlations between the five latent constructs testing the model fit. We did this on the whole sample with all three cities combined since we had no *a priori* hypotheses about why these should differ from place to place. Following this analysis, we used an EFA for each city separately to examine leadership types (a ‘bottom-up’ approach). In this step, we wanted to test whether different combinations of items appeared in the different cities, on the basis of covariance, rather than related to the hypothesized five leadership styles outlined earlier in this paper.

Testing five ideal types of leadership for innovation

Exploratory factor analysis

Measuring scales were adapted from the leadership literature and modified to meet the needs of this study focusing on leadership and innovation. To ensure that these modifications would not negatively impact on the quality of the study, an EFA: principal axis factoring extraction with promax rotation and Kaiser normalization was performed to extract factors.³ The scree plot suggested that a two-factor solution was appropriate (following the curve where the elbow bends in the scree plot), while four factors had eigenvalues >1. We experimented with three-, four- and five-factor solutions. The three-factor solutions gave us too much overlap in differentiating between the five theoretical concepts. For the four-factor solution, the rotated pattern matrix indicated that the motivational factors from the interpersonal concept (dedicated to colleagues and willing to sacrifice self-interest) loaded together with two important items of the network governance styles (works collaboratively and includes others in key decisions). In the literature, interpersonal leadership styles are very much about internal organizational processes, whereas network governance is about interorganizational relations. The fifth factor has an eigenvalue close to 1 (0.948). Since we have postulated five theoretical leadership concepts, we used the five-factor model in the results that follow. Table 4 shows the factor loadings of the scales with the five factors extracted (the first factor being the strongest and the fifth being the weakest), and with factor loadings below 0.3 suppressed to facilitate interpretation. These five factors explain 59 per cent of the data set.⁴

Table 4. Pattern matrix with five-factor solution (EFA).

(n = 365)					
Factors	1	2	3	4	5
F. Displays a long-term perspective	0.82				
B. Visionary	0.82				
L. Provides intellectual stimulation	0.70				
E. Visible leadership	0.64				
K. Inspirational	0.63				
Q. Knowledgeable	0.42				0.39
A. Communication skills	0.38				
W. Always follows procedure		−0.68			0.42
T. Open towards new ideas		0.64			
C. Takes initiatives		0.62			
S. Willing to risk mistakes by employees		0.57			
O. Good at mobilizing the resources needed		0.44			
J. Results-oriented		0.34			
U. Takes all decisions alone			−0.842		
V. Involves others in key decisions			0.584		
D. Authoritative			−0.520		
P. Works collaboratively			0.371		
N. Willing to sacrifice self-interest				1.0	
M. Committed to colleagues				0.48	
R. Good at learning from mistakes				0.32	
G. Displays a short-term perspective	−0.49				0.64
I. Problem-oriented					0.45
H. Good at gathering information					0.39
Variance explained (%)	35.0	8.2	6.5	5.0	4.1

[Appendix](#) provides an analysis of how close we were to getting the items on the same scales as predicted. The most notable difference was the interpersonal/ motivational concept that, in theory, overlapped significantly with the other concepts. In the empirical test (the EFA), the charisma characteristic was strongly related to transformational leadership styles, while the motivational factor denoted almost exclusively altruistic qualities loaded on one factor (number 4) – so in the following the items belonging to this factor are called the ‘altruistic leadership style’.

Reliability analysis

To examine how well the variables conform to the five scales we postulated, we also tested the reliability of the items using Cronbach’s α score (Tabachnick and Fidell 2014). In four out of the five scales, the degree of reliability was high – 0.85 for transformational, 0.79 for entrepreneurial, 0.74 for interpersonal skills that almost reflected the altruistic motivational variable and 0.68 for network governance which is just below the 0.7 desirability level for further analysis (Nunnally 1978). However, Nunnally (1988) indicates that newly developed measures can be accepted with an α value of 0.60, in an exploratory study like this, and Howell and Avolio (1993) observe

Table 5. Descriptive statistics, Cronbach's α coefficients and correlation matrix.

Factors	No. of items	Mean	SD	1	2	3	4	5
1.Transformational	7	22.65	4.8	0.85				
2.Entrepreneurial	5	16.4	3.5	0.67	0.79			
3.Network governance	2	6.6	1.5	0.61	0.56	0.67		
4.Altruistic	3	9.2	2.7	0.65	0.67	0.68	0.74	
5.Transactionnal	5	16.5	2.5	0.22	0.41	0.29	0.56	0.44

Notes: All correlations are significant at $p < 0.01$; Cronbach's α coefficients are shown on the diagonal (in bold) and correlation coefficients are below the diagonal.

that in the case of large samples (defined as more than 200) even this guideline is frequently relaxed.

The fifth scale (transactional) was not as coherent, producing an α of 0.44 when each of the five items expected to be related to this scale was included. This was the lowest score for our scales, possibly indicating that it could be removed as not significant for innovation. The scales and their reliability scores are shown in Table 5.

Table 5 shows that the correlations between the five scales are in most cases reasonably high, with the exception being the transactional factor. The transformational and altruistic factors have the highest correlations with the other scales, with the network governance and entrepreneurial factors not far behind. The observation that various leadership scales correlate with each other is supported by others (e.g. see Knippenberg and Sitkin 2013).

Confirmatory factor analysis

To further test whether the structure of the measures was acceptable, a CFA was used. In the CFA, we used a structural equation model (SEM) (and the software AMOS 18) to specify our five-factor model, based on the exploratory and reliability analyses presented above, indicating which variables load on which factors and which factors are correlated. The measurements then depend on the accuracy of the specifications on which the analysis is based. In contrast to EFA, only CFA can estimate models where two or more latent variables are assumed to covary. It directly estimates factor covariances, and control for these covariances in the calculation of parameters for items, such as our factor loadings (Kline 2010). The fit indices of the model are used to assess the fit of the measures to the data. We then get a goodness-of-fit measure of our data in relation to this model.

Our model (see Figure 1) uses the same five ideal types of leadership, and the data gathered using the twenty-three scale items on leadership, as for the previous analysis (the EFA). The CFA model is used to test its goodness of fit to the SEM shown in Figure 1. We then looked at possible modifications to optimize the goodness of fit, following the reliability analysis in Table 5. Appendix provides an overview of the final items in the five-factor model. Taking a closer look at the correlations of variables which load on the transactional factor (pattern matrix in Table 4), there was room for improvement following the test results.

Next, only items with correlations above 0.4 were included in the model – except for (P) works collaboratively with 0.37 that was included as theoretically very important for the network governance construct (and worked well in the model).

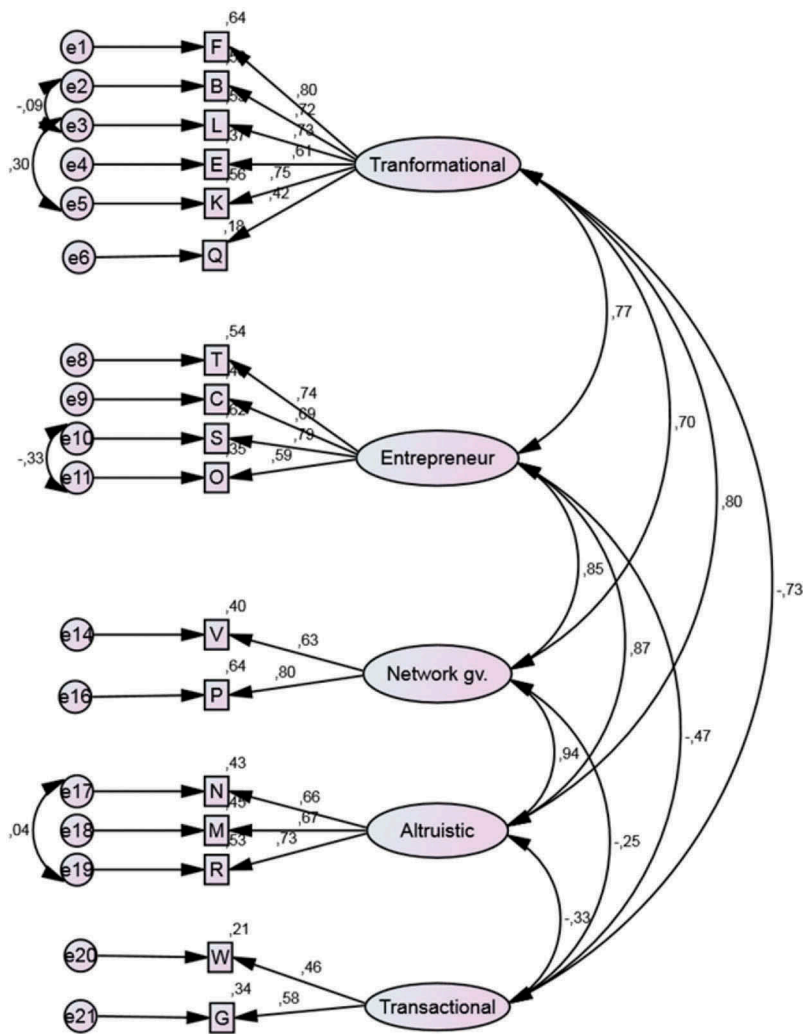


Figure 1. The hypothesized five-factor model.

Being more strict on constraints of the transactional construct, the following two variables – (H) good at gathering information and (I) is problem-oriented – were removed because these had fairly low loadings (0.39 and 0.42) in the factor analysis but even lower in the SEM model using AMOS (see test results of model optimized 1 in Table 6).

Several recommended measures of model fit were used. For the tested model, it is suggested that the four goodness-of-fit tests – CFI, NFI, TLI and GFI (see Table 6 for an explanation of these) – should be close to or higher than 0.90 to demonstrate an acceptable fit. It is also recommended that the RMSEA should be preferably lower than 0.06. However, it has recently been suggested by scholars that a score below 0.10 reflects an acceptable fit and below 0.08 reflects an excellent one (see Byrne 2012; Kline 2010). Our model meets these criteria. Furthermore, a value <5 for the CMIN/

Table 6. Statistical measures for model fit.

	CFI	NFI	TLI	IFI	RMSEA	CMIN/df
Model <i>p</i> -matrix	0.86	0.82	0.84	0.87	0.800	3.34
Model optimized 1	0.89	0.86	0.86	0.89	0.085	3.63
Model optimized 2	0.91	0.87	0.88	0.91	0.075	3.28

Notes: Signpost: CFI, comparative fit index; NFI, normed fit index; TLI, Tucker–Lewis index; RMSEA, root mean square error of the approximation; IFI, Bollen’s incremental fit index; CMIN/df, ratio of χ^2 to degrees of freedom.

PCLOSE = 0.000 (probability level) but this is due to the large sample size of $n = 365$.

DF (χ/df) ratio should be obtained. Additionally, it is good practice to check modifications of the residuals. Following Figure 1, the following unobserved variables was set to covary; e10 to e11; e3 to e5; e17 to e18; and, finally, e2 to e3. These were all on the same constructs, and we could then covary the model’s predicted variables in order to modify these residuals (see test results of model optimized 2).

The five-factor model met the recommended cut-offs for four of the six fit indices, only falling slightly short in regard to two others (NFI and TLI). Based on these findings, the five-factor model should be considered as a reasonable representation of the leadership constructed domains (scales). We conclude that the items, together with the five theoretical concepts, serve as a reasonable framework for exploring the perceptions of leadership styles among senior managers in the three government municipalities of Copenhagen, Rotterdam and Barcelona.

Individual cities: EFA for the three cities

In the analyses that follow, both principal component analysis with varimax rotation and principal axis factoring with promax rotation and Kaiser normalization were used to analyse the data for each city (see Tabachnick and Fidell 2014). The principal axis factor results are shown as the results from these give a clean matrix focusing on the difference (and not the likelihood) between the factors and the promax (oblique) rotation as some factors were related. In each case, a scree plot curve of the eigenvectors showed that three factors were appropriate (based on where the elbow of the graph was located) rather than using all the factors with an eigenvalue >1 (4 for Copenhagen, 5 in Rotterdam and 6 for Barcelona). Only factor loadings with a magnitude of 0.40 and higher are included for ease of interpretation in Tables 7–9.

Table 7 shows the results of the factor analysis for Copenhagen. It shows that there is one very strong factor for Copenhagen, which explains 36.6 per cent of the variance and involves a group of variables that relate to interpersonal leadership styles such as commitment, motivation, intelligence and collaboration. This has been labelled the ‘dedicated motivator’. The second innovation leadership type relates to the ‘entrepreneurial’ leadership style which allows mistakes by employees with a view to promoting learning. This type of leader does not always follow procedures, but is willing to take risks. The third leadership type, labelled the ‘the long-term planner’, relates both to the transformational and entrepreneurial leadership styles, displaying a long-term perspective and being visionary. Both these factors explain only small proportions of the variance – 7.1 and 5.7, respectively (Box 1).

Table 7. Copenhagen leadership qualities pattern matrix.

(<i>n</i> = 157)	1	2	3
M. Committed to colleagues and organization	0.705		
L. Provides intellectual stimulation	0.693		
N. Willing to sacrifice self-interest	0.675		
O. Mobilizing the resources needed	0.669		
H. Good at gathering information	0.655		
Q. Knowledgeable	0.561		
K. Inspirational	0.555		
J. Results-oriented	0.552		
A. Good communication skills	0.513		
V. Involves others in key decisions	0.511		
P. Works collaboratively	0.487		
I. Problem-oriented	0.471		
E. Visible leadership	0.427		
T. Open towards new ideas	0.425		
C. Takes initiative	0.407		
R. Good at learning from mistakes		0.569	
D. Authoritative		−0.538	
S. Willing to risk mistakes by employees		0.529	
W. Always follows procedures		−0.441	
U. Takes all decisions alone		−0.04	
F. Displays a long-term perspective			0.760
G. Displays a short-term perspective	0.516		−0.715
B. B. Visionary			0.546

Box 1. Copenhagen leadership factors.

Factor	Description	Percentage of the variance explained
(1) The dedicated-motivator	Committed to colleagues, provides intellectual stimuli, willing to sacrifice self-interest good at mobilizing the resources needed, good at gathering information, knowledgeable, inspirational, result-oriented, involves others in key decisions, works collaboratively, is problem-oriented, displays visible leadership, is open towards new ideas and takes initiatives	36.6
(2) The entrepreneurial leader	Good at learning from mistakes, is the opposite of authoritative, is willing to allow mistakes by employees, does not always follow procedures and never takes decisions alone	7.1
(3) The long-term planner	Displays a long-term perspective and is visionary	5.7

The analysis for Rotterdam, (see [Table 8](#)) provides quite a different picture of what kind of leadership characterizes the municipality. The first factor explains 27.1 per cent of the variance, and is labelled the ‘the transformational leader’, the second explains 10.0 per cent and is labelled the ‘collaborative-motivator’, and the third explains 6.8 per cent and is labelled the ‘long term planner’ ([Box 2](#)). The first and second factors are very similar to the committed-motivator type found in Copenhagen but split into a transformational style of leadership and a more collaborative/network style of leadership. The third style of leadership, resembles the third factor in Copenhagen but has more characteristic from the transformational style.

The Barcelona analysis (see [Table 9](#)) offers yet another picture of views on leadership and innovation. In the Barcelona sample, a network governance entrepreneurial leadership type (called the collaborative entrepreneur) is the strongest factor, and a mix of transformational and motivator type is the second strongest (called the transformational leader). The collaborative entrepreneur factor explains 30.4 per cent of the variance, the transformational leadership type explains 11.6 per cent and the third factor which explains 8.9 per cent is labelled the transactional leadership type having an almost classic rational leadership approach ([Box 3](#)).

Barcelona stands out by having a clean ‘rational type’ of transactional leadership on its third factor but it is also the weakest type (explaining only 8.7 per cent of the variance). In summary, we found that all three cities shared some form of

Table 8. Rotterdam leadership qualities pattern matrix.

(<i>n</i> = 150)	1	2	3
C. Takes initiative	0.724		
T. Open towards new ideas	0.722		
W. Always follows procedures	−0.633		
J. Results-oriented	0.597		
S. Willing to risk mistakes by employees	0.511		
D. Authoritative	0.435		
E. Visible leadership			
A. Good communication skills			
V. Involves others in key decisions		0.738	
P. Works collaboratively		0.683	
O. Mobilizing the resources needed		0.500	
M. Committed to colleagues and organization		0.492	
U. Takes all decisions alone		−0.438	
N. Willing to sacrifice self-interest		0.437	
H. Good at gathering information		0.402	
R. Good at learning from mistakes			
Q. Knowledgeable			
I. Problem-oriented			
F. Displays a long-term perspective			0.832
G. Displays a short-term perspective			−0.577
B. Visionary			0.540
K. Inspirational			0.519
L. Provides intellectual stimulation			0.401

Box 2. Rotterdam leadership factors.

Factor	Description	Percentage of the variance explained
The transformational leader	Takes initiative, open to new ideas, is results-oriented, does not always follow procedures, is willing to risk mistakes by employees, but is somewhat authoritative	27.1
The collaborative motivator	Involves others in key decisions, works collaboratively, good at mobilizing the resources needed, committed to colleagues and organization, willing to sacrifice self-interest, good at gathering the information needed	10.0
The long-term planner	Displays a long-term perspective, is visionary, inspirational and provides intellectual stimulation	6.8

Table 9. Barcelona leadership qualities pattern matrix.

(<i>n</i> = 55)	1	2	3
S. Willing to risk mistakes by employees	0.973		
P. Works collaboratively	0.819		
U. Takes all decisions alone	−0.762		
M. Committed to colleagues and organization	0.736		
V. Involves others in key decisions	0.730		
D. Authoritative	−0.618		
T. Open towards new ideas	0.542		
R. Good at learning from mistakes	0.515		
N. Willing to sacrifice self-interest	0.511		
O. Mobilizing the resources needed	0.454		
J. Results-oriented	0.418		
C. Takes initiative	0.414		
L. Provides intellectual stimulation		0.819	
F. Displays a long-term perspective		0.651	
K. Inspirational		0.598	
E. Visible leadership		0.581	
B. Visionary			
A. Good communication skills			
Q. Knowledgeable			0.772
W. Always follows procedures			0.759
G. Displays a short-term perspective			0.623
I. Problem-oriented			0.563
H. Good at gathering information			

motivational, entrepreneurial, network governance and transformational leadership style – but Copenhagen had the strongest perception of leadership styles with an altruistic motivational skills factor appearing as the strongest set of qualities that are important for innovation, based on the views of the public managers in our survey.

Box 3. Barcelona leadership factors.

Factor	Description	Percentage of the variance explained
The collaborative entrepreneur	Willing to risk mistakes, works collaboratively, committed to colleagues and organization, involves others in key decisions, open to new ideas, good at learning from mistakes, willing to sacrifice self-interest and mobilizing the resources needed	30.4
The transformational leader	Provides intellectual stimulation, displays a long-term perspective, inspirational and displays a visible leadership	11.6
The transactional leadership	Knowledgeable, always follows procedures, displays a short-term perspective and is problem-oriented	8.9

Discussion and conclusion

In this paper, we have developed and tested five perspectives on leadership for innovation in the public sector. We have shown that of the five hypothesized perspectives four of these could be observed empirically using data from three cities in different nations. The perspective that was least convincing as a scale was the transactional type, which encapsulates a view of leadership that relies mostly on rational approaches, incentives and strategies to obtain the desired performance, and a clear hierarchical relationship between leaders and other actors. Given the contemporary predominance of other forms of leadership in the literature and in practice, it is perhaps not surprising that this perspective received little support from the respondents to the survey. Future work on leadership for innovation in the public sector might consider trying different items to capture this dimension in order to determine whether it is simply not very salient, or whether this is related to our scale items.

The second analysis in this paper examined whether we could find these leadership scales in three cities with disparate governance tradition and organizational structures, and if so what would be the differences and similarities? The study reveals that leading innovation in public-sector environments is not perceived to require exactly the same skills in these different cities, despite the respondents in each case being in similar positions in these municipalities. Copenhagen was the most different, with a strong first factor based on interpersonal and network perspectives. The strongest factors in Rotterdam and Barcelona show more items from the transformational perspective (visionary, takes initiative) that play a more minor role in Copenhagen.

However, while Copenhagen managers nominated a more altruistic collaborative style than Barcelona and Rotterdam, it is clear that the collaborative element is also important in all three cities. In Rotterdam, it is strongly present in the second factor, and in Barcelona it is a very visible part of the first factor (the strongest). Across the three cities, it seems that leadership style for innovation is mostly perceived as a mix of a transformational leadership style that emphasizes visionary leadership and is inspirational, along with a more collaborative/interpersonal leadership style that provides intellectual stimulation, is willing to risk mistakes by employees and emphasizes the leadership qualities of working collaboratively.

In this sense, our findings differ from research on transformational leadership styles reported from the private sector and from the tone of much of the current public-sector literature. Our findings thus provide a more nuanced picture compared to existing research. They show strong similarities in the selected leadership qualities of the senior managers in regard to innovation. One likely explanation for this could be that despite culture- and country-specific characteristics, the leadership literature that senior public managers are exposed to through their training and professional development is similar in all three contexts. That is, they all might have read the same texts and ideas about what is (in theory) positively associated with being a successful leader. On the other hand, given that these are all senior managers in municipal governments, they are all likely facing similar challenges to some extent, even though they are in different European countries.

Given the emphasis currently being placed on leading change and innovation in the public sector, we argue that this study makes an important contribution to understanding how public managers understand leadership and innovation. Recent studies are becoming more critical towards the idea of transformational leadership (see Knippenberg and Sitkin 2013). With this and our findings in mind, we argue that it is time to broaden the perspective of leadership research in the public sector beyond the transformational type and to look for other important qualities such as risk, motivation and network governance skills rather than visionary leadership alone.

Limitations and future research

Innovation is not a simple, unproblematic or value-free concept, and its increasing use to cover a multitude of changes, reforms and other responses to perceived crises is only making research on public-sector innovation more important. For this study, we have provided no empirical reporting of defined innovations or innovative activity, or evaluations of outcome emanating from the three cities/municipalities in the study. The article is based on self-reported data and is thus about the normative opinions of senior municipal governments managers on leadership qualities in relation to innovation, based on their direct experiences, within the set of conceptual leadership choices offered. Thus, the article does not provide evidence to conclude whether the leadership styles perceived as the most important are also actually evaluated as successful or unsuccessful for innovation, or whether these are what is actually implemented in these municipalities. Given the nature of our questions, our data do not allow us to confirm that these qualities are what actually spur innovation, and neither was this what we set out to do. Further, we do not make any claims about the generalizability of these findings to public managers in other municipalities or in other public-sector organizations.

What our results do suggest is the existence of identifiable public leadership styles which are regarded as promoting innovation in these three municipal governments. They also suggest a need to go beyond the current emphasis on transformational leadership and to consider other leadership skills that might be just as important for innovation in the public sector.

The three municipalities of Copenhagen, Rotterdam and Copenhagen are all three Western societies and the municipalities' administrations are to be considered as modern administrations. The common attributes for these three modern public administrations probably show how the current leadership literature spreads

particular visions of leadership across the public (and private) sector – despite being geographically situated in northern, central and southern Europe. More research in this direction should broaden the variety of styles and underlying attributes which public managers are exposed to as professionals. This should provide a better menu from which they can select when taking on leadership roles that require them to foster innovation.

Notes

1. European Commission Innovation Union Scoreboard website < http://ec.europa.eu/enterprise/policies/innovation/facts-figures-analysis/innovation-scoreboard/index_en.htm>, accessed 15 August 2014.
2. One explanation for the low response rate from Barcelona was that the managers at the third administrative level tended not to answer the survey if they knew that their superior at the second administrative level had already responded to it.
3. Promax (oblique) rotation was chosen as we expect that some of the factors are related (Table 2).
4. To test this five-factor solution, the Kaiser–Meyer–Olkin measure of sampling adequacy statistic of the measuring scales was performed, showing 0.916, which is well above the acceptable limit of 0.8 (Kaiser and Rice 1974; Kaiser 1970); and Bartlett’s sphericity test, which revealed an approximate χ^2 value of 3414.827 with 253 degrees of freedom ($p = 0.000$), indicating that the data is suitable for factor analysis.

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Appendix. Theoretical versus empirical items on scales and in model.

Item placement	In theory	Empirical (EFA)	Model (CFA)
A. Communication skills	Interpersonal	Transformational (low)	Transformational (low-out)
B. Visionary	Transformational, entrepreneur	Transformational	Transformational
C. Takes initiative	Transactional, transformational, entrepreneur	Entrepreneur	Entrepreneur
D. Authoritative	Transactional	(-) Network governance	(out)
E. Visible leadership	Transformational	Transformational	Transformational
F. Displays a long-term perspective	Transformational, network governance, entrepreneur	Transformational	Transformational
G. Displays a short-term perspective	Transactional	Transactional	Transactional
H. Good at gathering information	Transactional, network governance, entrepreneur	Transactional (low)	Transactional (low-out)
I. Problem-oriented	Transformational	Transactional	Transactional (low-out)
J. Results-oriented	Transformational	Transactional	Entrepreneur
K. Inspirational	Transformational	Transformational	Transformational
L. Provides intellectual stimulation	Interpersonal	Transformational	Transformational
M. Committed to colleagues and organization	Transformational, interpersonal, network governance	Altruistic	Altruistic
N. Willing to sacrifice self-interest	Interpersonal	Altruistic	Altruistic
O. Mobilizing the resources needed	Transformational, network governance, entrepreneur	Entrepreneur	Entrepreneur
P. Works collaboratively	Network governance	Network governance (low)	Network governance
Q. Knowledgeable	Interpersonal	Transformational	Transformational
R. Good at learning from mistakes	Interpersonal	Altruistic (low)	Altruistic
S. Willing to risk mistakes by employees	Interpersonal	Entrepreneur	Entrepreneur
T. Open towards new ideas	Entrepreneur	Entrepreneur	Entrepreneur
U. Takes all decisions alone	Transactional	Transactional	Transactional
V. Involves others in key decisions	Network governance	Network governance	Network governance
W. Always follows procedures	Transactional	Transactional, (-)entrepreneur	Transactional